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Economic and Energy Outlook of Japan for FY2020

Leveled off Japan's economic growth and shift to low carbon

ETO Ryo, H. Okabayashi, N. Aizawa, C. Onda, T. Iwata, Y. Shibata, S. Suehiro, A. Yanagisawa and K. Ito

Summary of economic and energy outlook [Reference Scenario]

Macro economy | Economy will marginally grow depending on public demand

While foreign demand in FY2020 will turn to contribute positively in line with global economic recovery, private demand will show signs of slowing down. For three years in a row, public demand is contributing the most to an increase. Industrial production will slightly rise, however, it will not reach the level of FY2017. The balance of trade will turn to be positive, thanks to a fall in fossil fuel prices.

Energy supply and demand | Primary energy supply will decrease for the third year in a row and CO_2 will decrease for its seventh year in a row, but both will be reduced by less than 1% for the second year in a row.

Primary energy supply in Japan in FY2019 decreases by 0.3% from the previous year due to an industry production fall, although growing heating demand after the warmer-than-normal winter in the previous year will exert upward pressure. In FY2020, primary energy supply will decrease by 0.4% on an ethylene production cut and energy efficiency improvements. (-0.4%). The trend away from fossil fuels towards non-fossil fuel will continue but while production from renewables will increase before the deadline of the penalty set for the FIT, nuclear will increase a much slower pace due to delays in the completion of counterterrorism facilities.

In FY2020, however, CO_2 emissions will decrease by 0.5% to 1,048 Mt which is lower than 1,050Mt for the first time, according to the statistics after FY1990. This corresponds to a reduction of -15.1% from FY2013, which means that two-thirds of the reduction target of energy-related CO_2 emissions set for FY2030 will be achieved in FY2020.

Energy sales | Electricity sales will increase gradually. City gas sales will not reach a record high despite increased sales to electric utilities. Fuel oil sales will decline for an eighth consecutive year and will consist of just two-thirds of the record high

Overall electricity sales in FY2019 increase by 0.1%. Lighting services increase in reaction to a fall amid the warmer-than-normal winter in the previous year, and power services decrease reflecting a production fall in the iron and steel production and machinery. In FY2020, electricity sales will increase by 0.4%. Power services will increase in line with the recovery of production activities concentrating on machinery industry while lighting services should decrease slightly, on the further penetration of energy-efficient appliances.

Overall total city gas sales in FY2019 are flat. There are decreases for general industries with production fall and for commercial and others due to a cooler summer. Sales increase for electric utilities, due to the operation of new city gas-fired power plants, and for space and water heating requirements in household due to a return from the previous year's milder winter. In FY2020, although sales for industries will increase due to the increase in sales for electric utilities and because of the recovery of production, the overall sales

(+2.0%) will be less than the record high of FY2017 due to a slowdown in fuel switching to city gas and a warmer winter than when the sales were the highest.

Table 1 | Summary of Reference Scenario

		Historical				Projection		Year-over-year		
		FY2010	FY2016	FY2017	FY2018	FY2019	FY2020	FY2018	FY2019	FY2020
Energy	Primary energy supply (Mtoe)[1]	515.9	463.1	465.1	456.1	454.1	452.4	-1.9%	-0.4%	-0.4%
	Oil[2] (GL)	232.3	205.1	202.8	192.8	190.5	186.0	-4.9%	-1.2%	-2.4%
	Natural gas[2] (Mt of LNG equiv.)	73.3	88.1	85.6	81.7	81.1	79.1	-4.5%	-0.7%	-2.4%
	Coal[2] (Mt)	184.7	188.0	192.2	188.1	187.4	191.9	-2.1%	-0.4%	2.4%
	Nuclear (TWh)	288.2	17.3	31.3	62.1	61.0	63.5	98.6%	-1.9%	4.2%
	Renewable electricity[3] (TWh)	111.2	154.9	169.4	178.4	191.3	203.3	5.3%	7.2%	6.3%
	FIT generation (TWh)	63.2	112.8	123.2	135.2	147.2	158.0	9.8%	8.9%	7.3%
	Self-sufficiency ratio	20.2%	8.2%	9.5%	11.8%	12.0%	12.5%	2.3p	0.2p	0.4p
	Electricity sales[4] (TWh)	(926.6)	850.5	863.2	852.6	853.6	856.7	-1.2%	0.1%	0.4%
	City gas sales[5] (Billion m^3)	39.28	41.53	42.48	41.58	41.58	42.43	-2.1%	0.0%	2.0%
	Fuel oil sales (GL)	196.0	176.9	174.8	167.7	165.8	161.7	-4.1%	-1.1%	-2.5%
	Energy-related CO_2 emissions (Mt)	1,137	1,129	1,110	1,060	1,053	1,048	-4.5%	-0.6%	-0.5%
	(Changes from FY2013)	-7.9%	-8.6%	-10.1%	-14.2%	-14.7%	-15.1%	-4.0p	-0.5p	-0.4p
Prices	Crude oil, import, CIF ($/bbl)	84	48	57	72	68	66	26.7%	-6.4%	-1.8%
	LNG, import, CIF ($/MBtu)	11.3	7.0	8.5	10.6	9.5	8.9	24.9%	-10.4%	-5.7%
	Steam coal, import, CIF ($/t)	114	81	103	121	100	87	17.5%	-17.4%	-12.6%
	Coking coal, import, CIF ($/t)	175	111	147	160	135	120	8.9%	-15.5%	-11.4%
Economy	Real GDP (JPY2011 trillion)	493.0	522.0	532.0	533.7	537.2	540.1	0.3%	0.7%	0.6%
	Industrial production (CY2015=100)	101.2	100.6	103.5	103.8	101.3	101.8	0.2%	-2.4%	0.5%
	Balance of trade (JPY trillion)	5.3	4.0	2.4	-1.6	-2.9	0.4	-166%	83.1%	-112.6%
	Fossil fuel imports (JPY trillion)	18.1	13.1	16.3	19.1	16.8	15.9	17.5%	-11.8%	-5.9%
	Exchange rate (JPY/$)	86.1	108.4	111.1	110.6	108.8	108.0	-0.4%	-1.7%	-0.7%
	Cooling degree days	559	431	397	489	439	382	23.2%	-10.2%	-13.1%
	Heating degree days	1,079	965	1,071	866	982	1,017	-19.2%	13.5%	3.5%

Notes:

1. Mtoe = 10^{13} kcal
2. Conversion factors for oil: 9,126 kcal/L; Natural gas: 13,043 kcal/kg; Steam coal: 6,139 kcal/kg; Coking coal: 6,928 kcal/kg until FY2012. Conversion factors for oil: 9,145 kcal/L; Natural gas: 13,016 kcal/kg; Steam coal: 6,203 kcal/kg; Coking coal: 6,877 kcal/kg since FY2013.
3. Including large hydro 30 MW or more. 4. Figures in parentheses are old statistical figures. 5. Conversion factor: 1 m^3 = 10,000 kcal

Despite the impact of a colder winter than in the previous year, fuel oil sales in FY2019 continue to decrease reflecting lower oil-fired power generation, the improvement of vehicle fuel efficiency, and fuel switching to other energies (-1.1%). Although sales of diesel oil and jet fuel will remain firm, fuel oil sales in FY2020 will further decrease by 2.1% for the eighth consecutive year due to a sharp decline in naphtha sales amid more frequent regular repairs at petrochemical plants and a substantial fall in heavy fuel oil C sales for power generation. The FY2020 sales will be equivalent to two-thirds of the FY1999 peak of 246 million kL.

Renewable power generation | The FIT power generation capacity will reach 83 GW at the end of FY2020

As FIT approval for some non-residential solar PV capacity (such as mega-solar plants) was cancelled due to the establishment of a deadline for making approved FIT capacity operational, the approved capacity decreased to 89 GW in June 2019. If the FIT capacity totalling 89 GW becomes operational, the cumulative burden on consumers will come to JPY60 trillion, including components for operational and transferred facilities. The estimated burden amounts to an electricity bill hike of JPY3.4/kWh – 15% for the residential sector and 21% for industry and other sectors. The facilities under construction are expected to become operational, boosting installed renewable energy-based power generation capacity (including capacity subject to FIT contract expiration) to 83 GW by the end of FY2020. The completion is accelerated by the

deadline of the penalty set for the FIT act. Renewable energy-based power generation in FY2020 will total 152.3 TWh (including 76.2 TWh for solar PV, 39.6 TWh for small and medium-sized hydroelectric plants, 30.2 TWh for biomass etc.), accounting for 15% of Japan's total power generation.

Topic |

1 Residential energy consumption by use

Residential energy consumption after the Great East Japan Earthquake is on a downward trend with the penetration of energy-efficient appliances and actions for energy saving exceeding the increases in the number of households. However, in FY2019, residential energy consumption increases 2.1% with increases in space heating and water heating due to a colder winter relative to the previous year. In FY2020, residential energy consumption will slightly decrease 0.2% with less cooling requirements due to a cooler summer from the previous year and improvements of energy efficiency in the power, etc. Following a slight decrease in FY2019, energy consumption for cooking will slightly increase in FY2020 reflecting an increase in the number of households and partly offset by lower demand due to lifestyle changes.

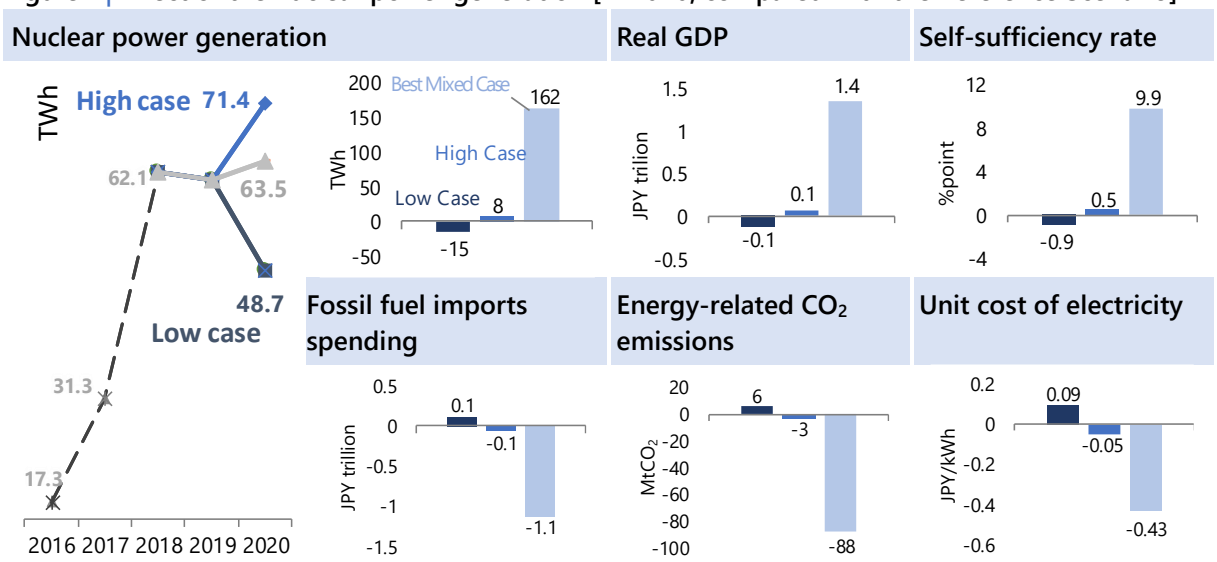
2 Impacts of regulation of sulfur content in ship fuel on domestic vessel

Under worldwide regulations set by the International Marine Organization (IMO), the sulfur content in ship fuel will be regulated from the current maximum of 3.5% to less than 0.5% after Jan 2020. Sales for domestic vessels are 3.17 GL in FY2019 and will be 3.09 GL in FY 2020 out of which 0.71 GL and 2.15 GL of Very Low Sulfur Fuel Oil(VLSFO) satisfies the new regulations. With the efforts of both public and private entities, the VLSFO will be supplied stably. If the price of VLSO is similar to LSC fuel oil C for power utilities, the price will rise by JPY3.6/ L and the total fuel costs will increase by 11.3 billion JPY(6.3%). If the price increase is equivalent to fuel oil A, it will rise by JPY9.7/ L , and for a total fuel costs increase of 30.1 billion JPY (17.1%). 79 kt of SO_2 will be reduced in FY2020, thus, the reduction costs will be JPY140～379 thousands/tSO_2. Switching to VLSFO does not contribute to reduce other gases such as CO_2. Thus, paying attention to markets of oil and domestic vessel and implementing appropriate environmental measures will be important.

3 Impacts of the completion of counterterrorism facilities and of the delays in nuclear plant restarts

We assessed the impacts of nuclear power generation on 3Es – economy efficiency, energy security and environment. In the High Case, where the three plants now in operation would remain in operation with their counterterrorism facilities completed within their respective deadlines, the cost of fossil fuel imports would be reduced by JPY60 billion, the self-sufficiency rate would be improved by 0.5 points, and CO_2 emissions would be reduced by 3 Mt. Plants which have a deadline for the completion of their counterterrorism facilities after FY2020 will increase. Smoothing the restart of the nuclear power generation with functional examinations contributes to achieving 3Es.

Figure 1 | Effect of the nuclear power generation [FY2020, compared with the Reference Scenario]



Contact :report@tky.ieej.or.jp